

A

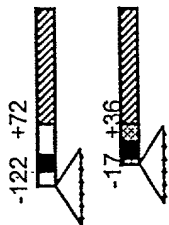
Reporters:

Reporter I

(p5' CF)

Reporter II

(pC7rbTATA)



Activator (pND3008): 2C7-VP64 (six-finger ZFP)



B

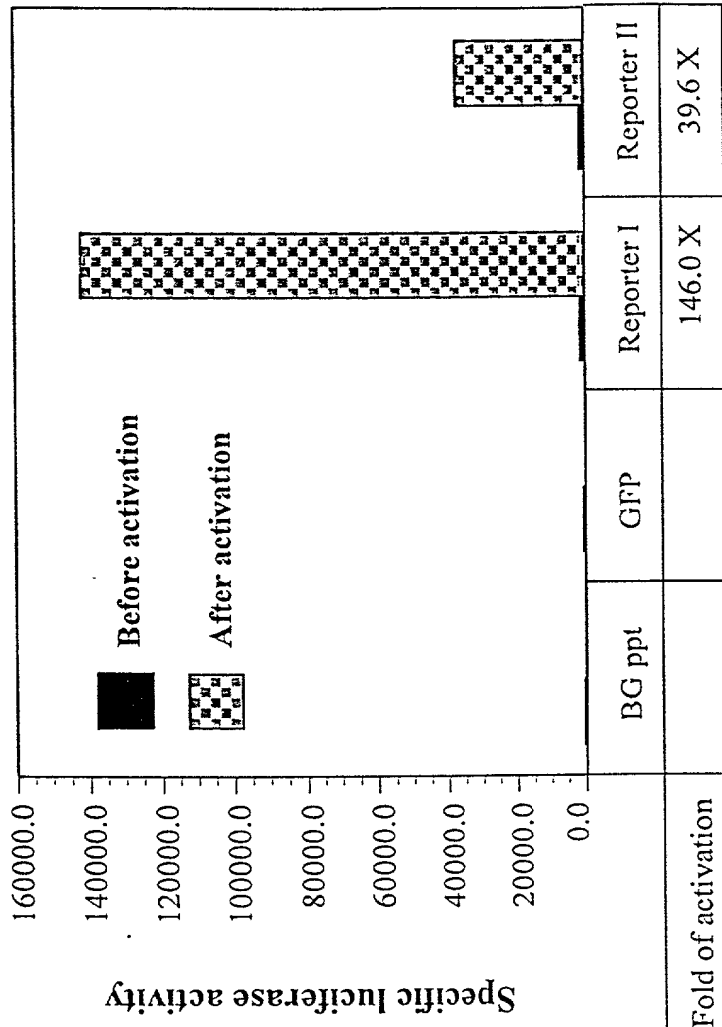


Figure 1

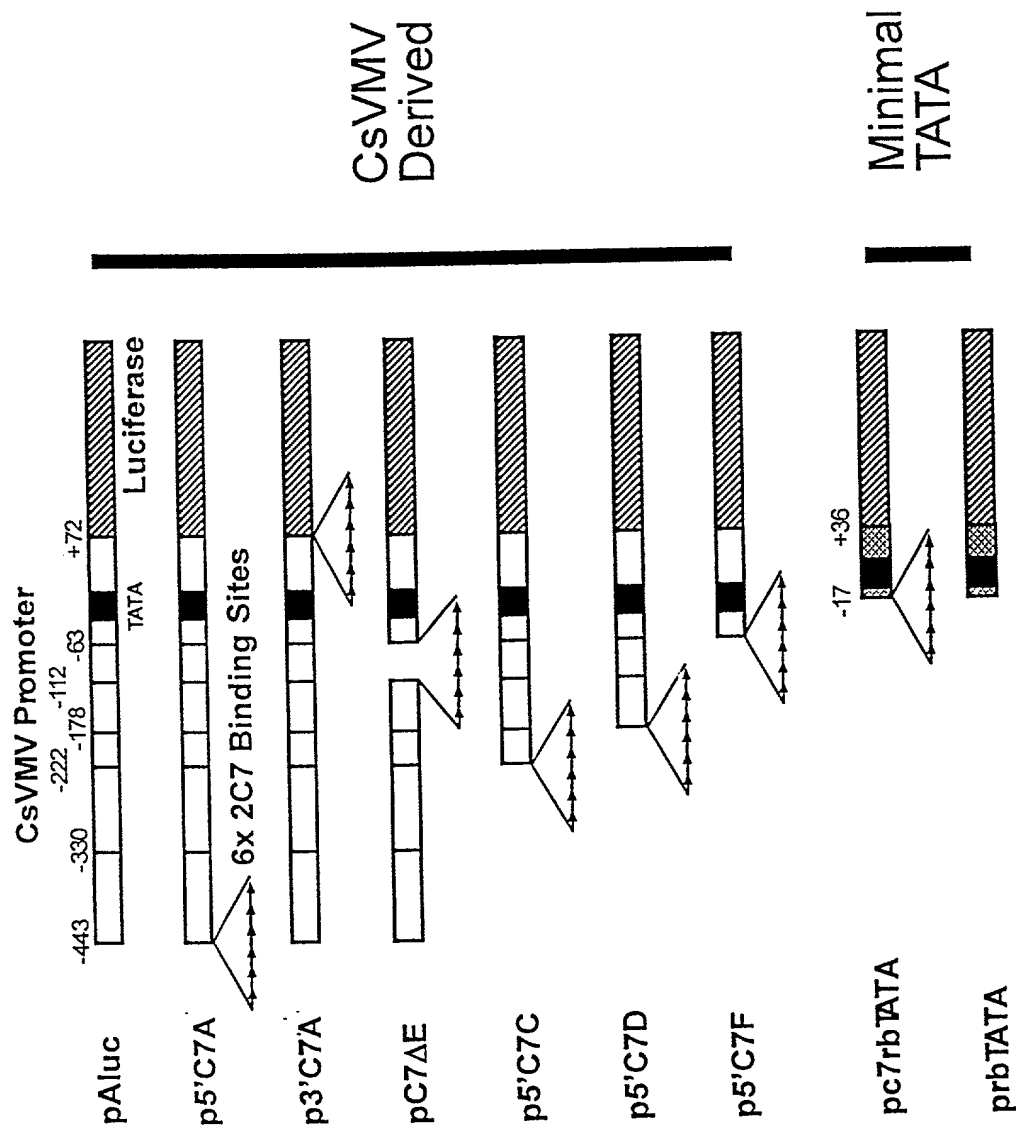


Figure 2

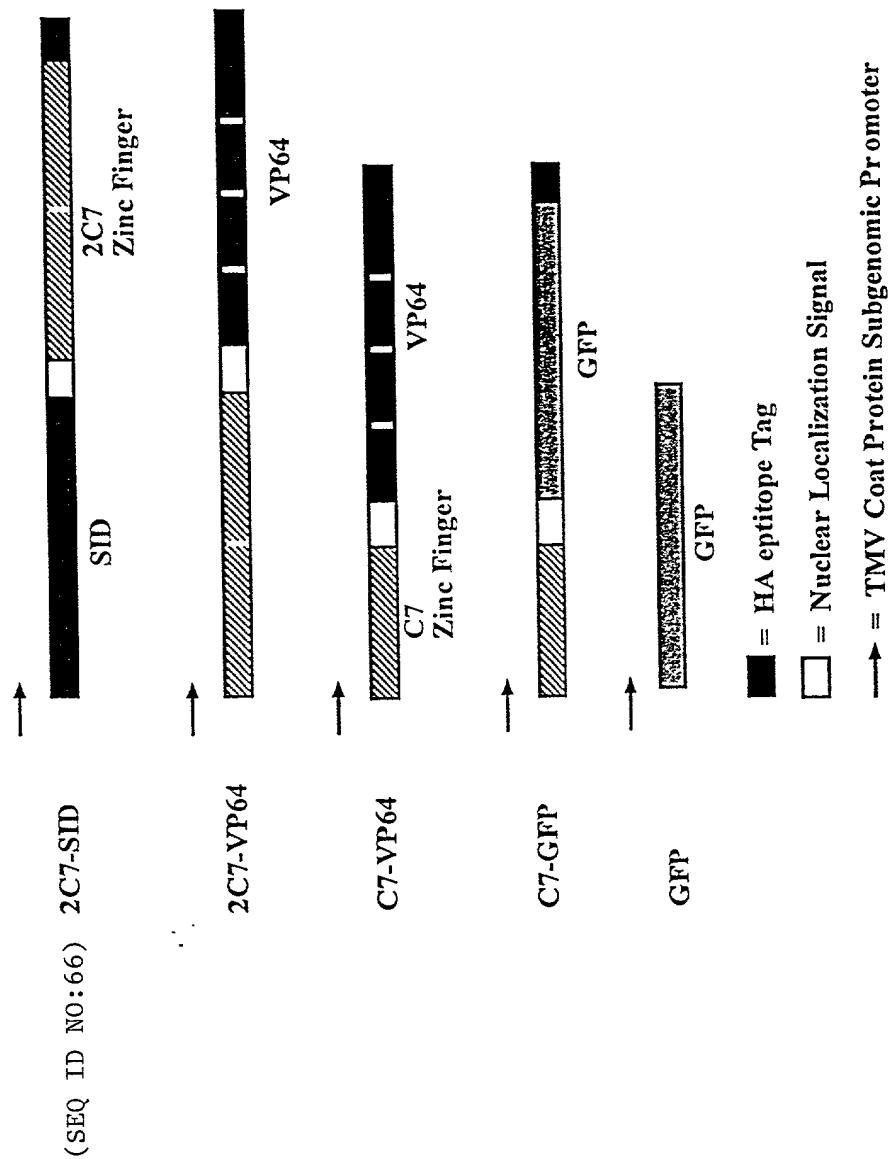


Figure 3

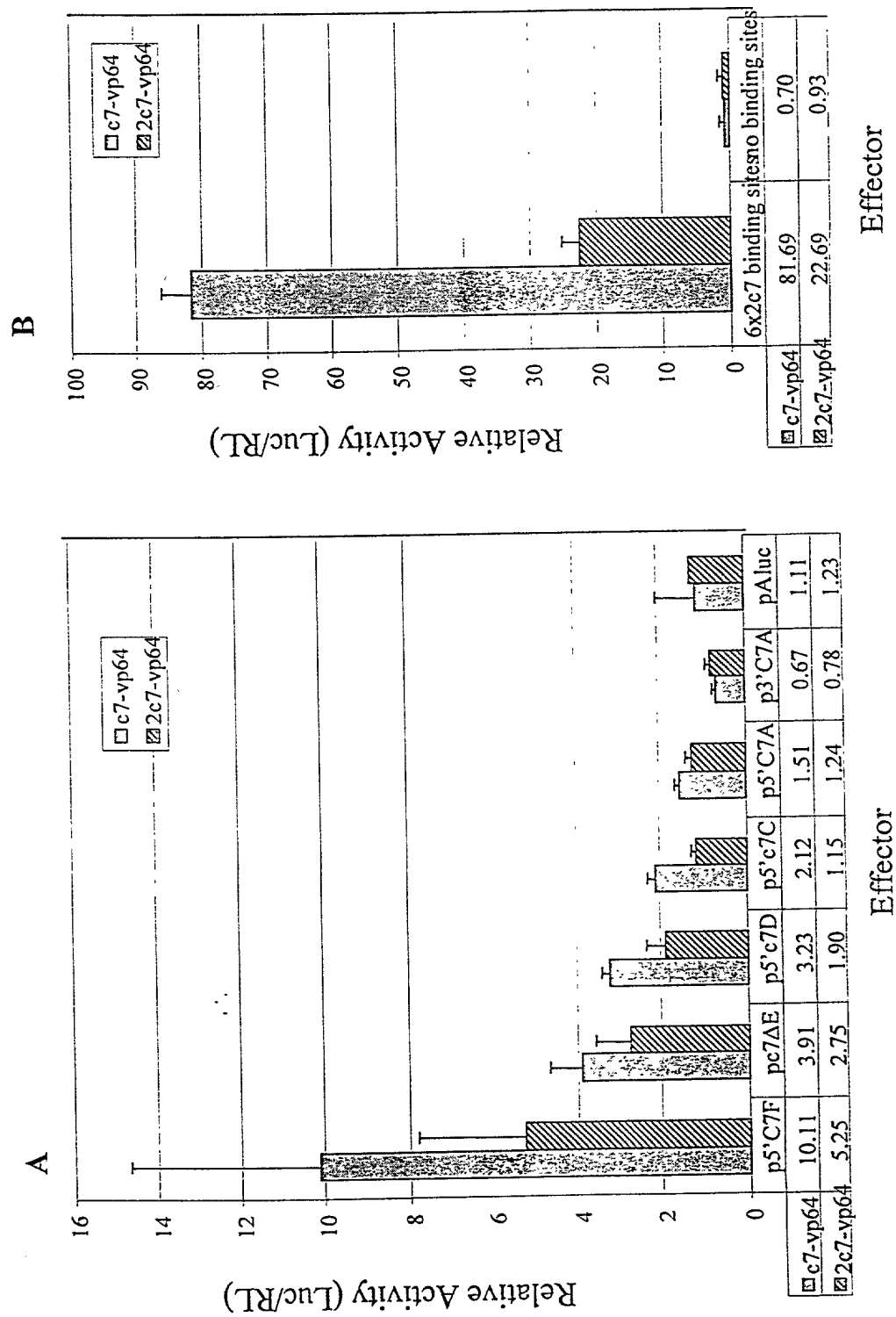


Figure 4

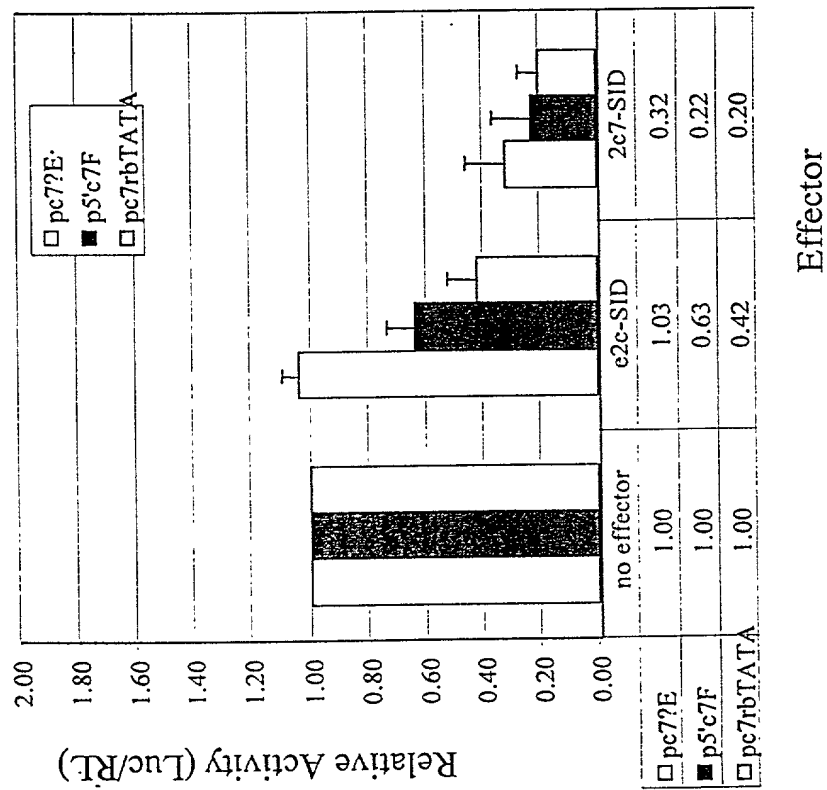


Figure 5

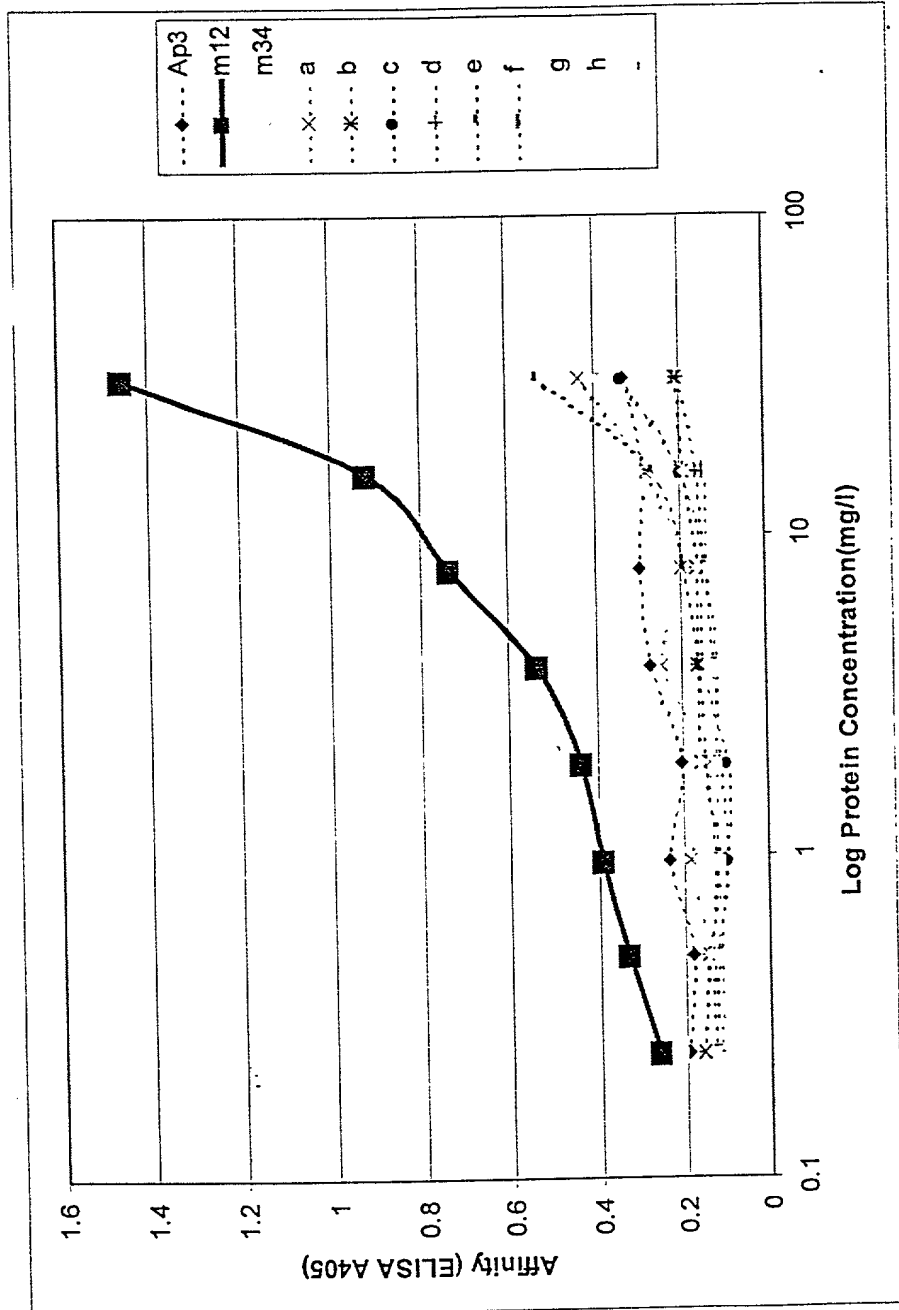


FIGURE 7

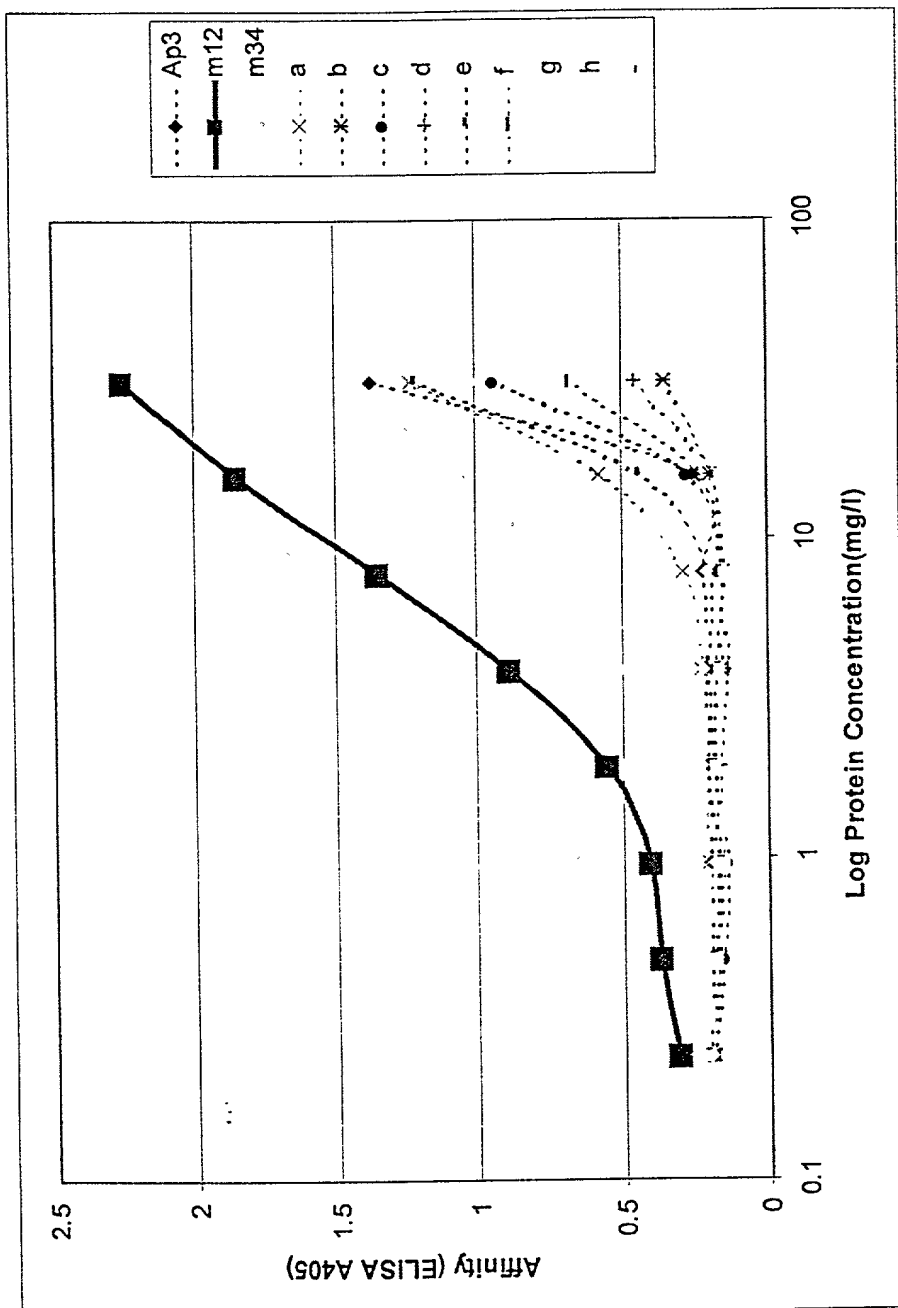


FIGURE 8

FIGURE 9

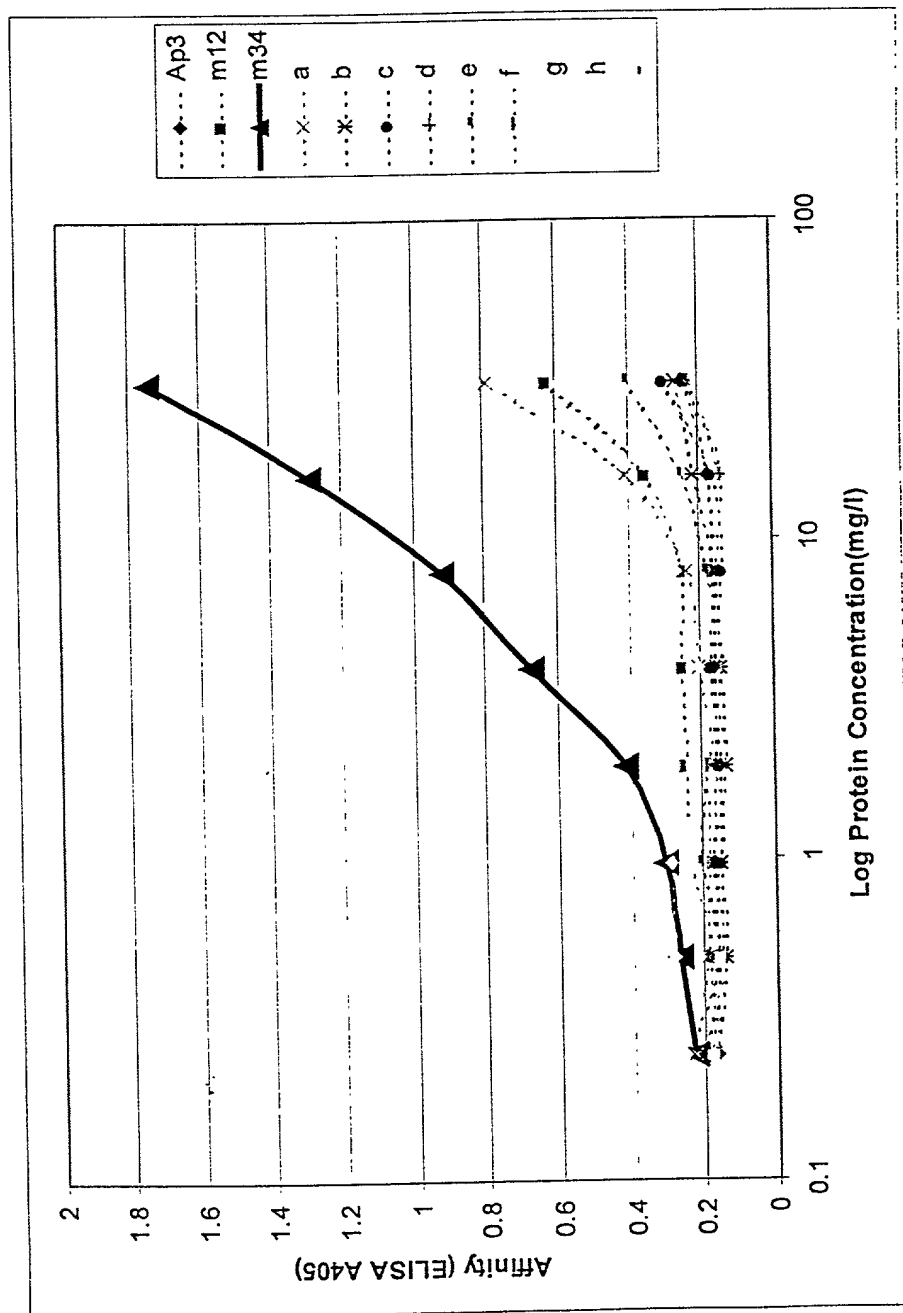


FIGURE 10

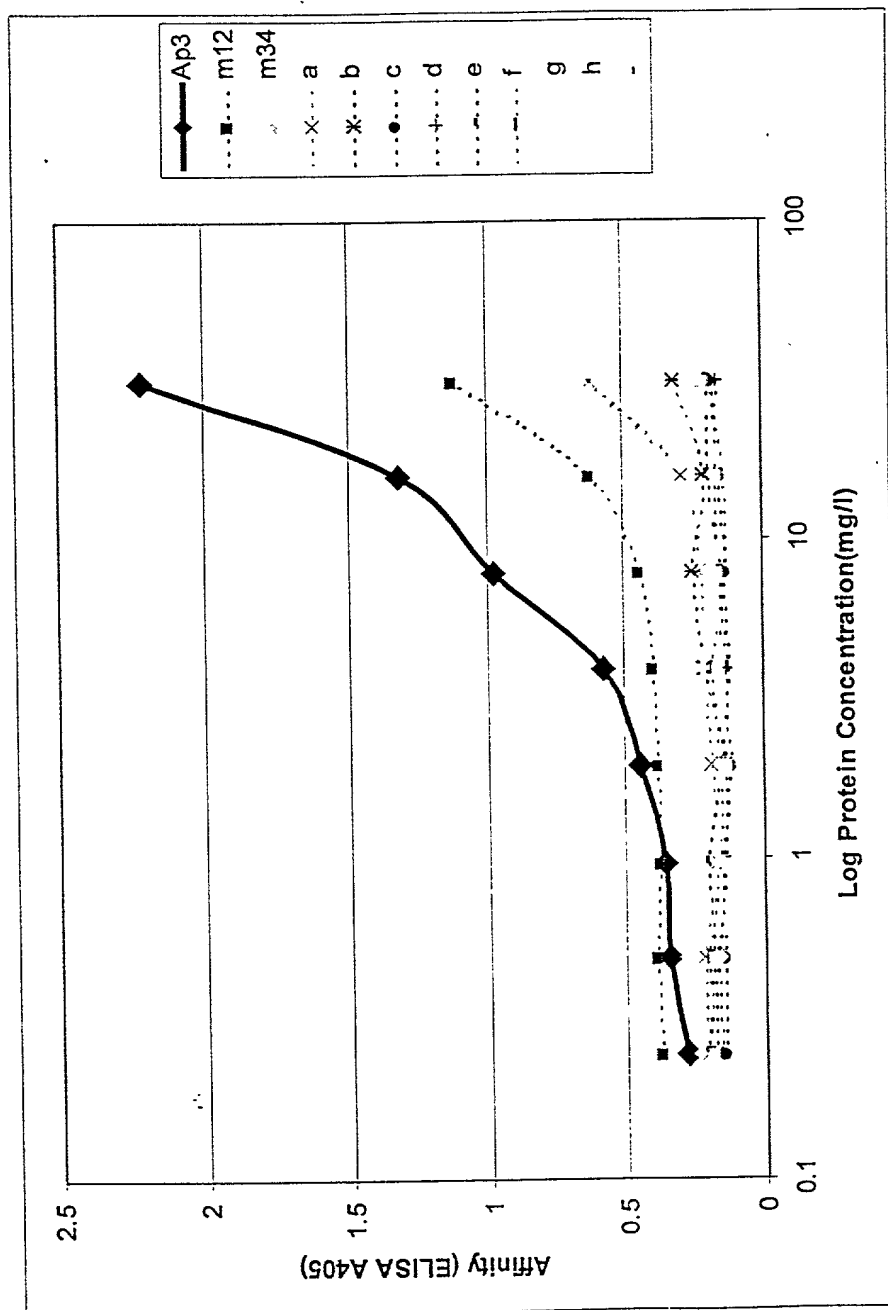


FIGURE 11

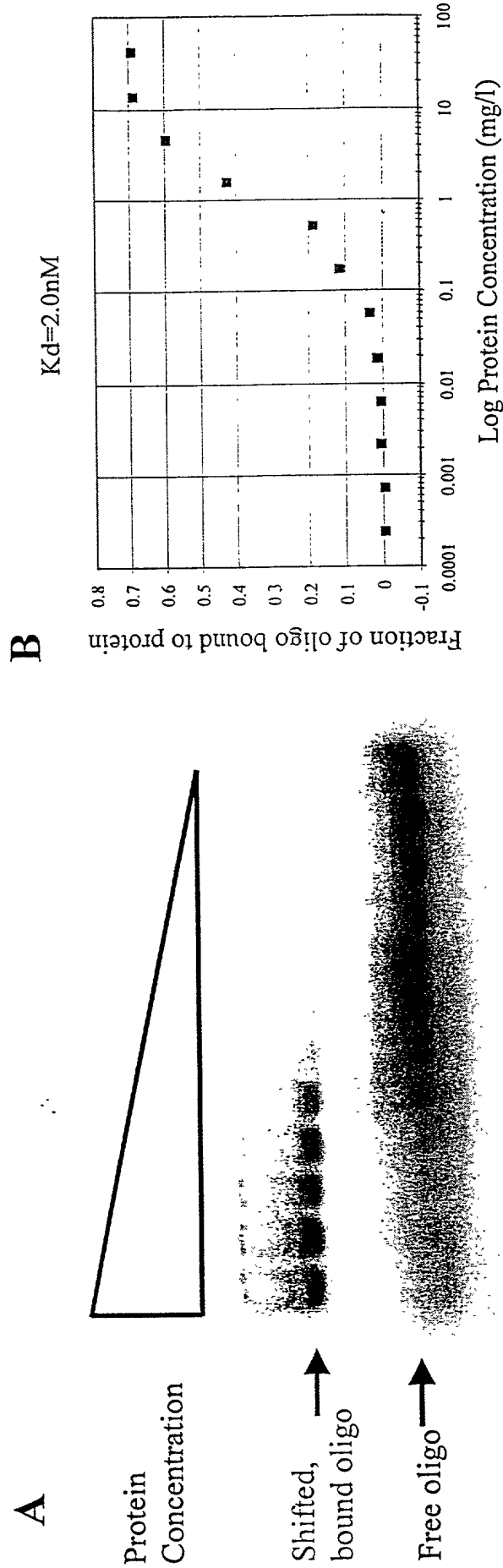


FIGURE 12

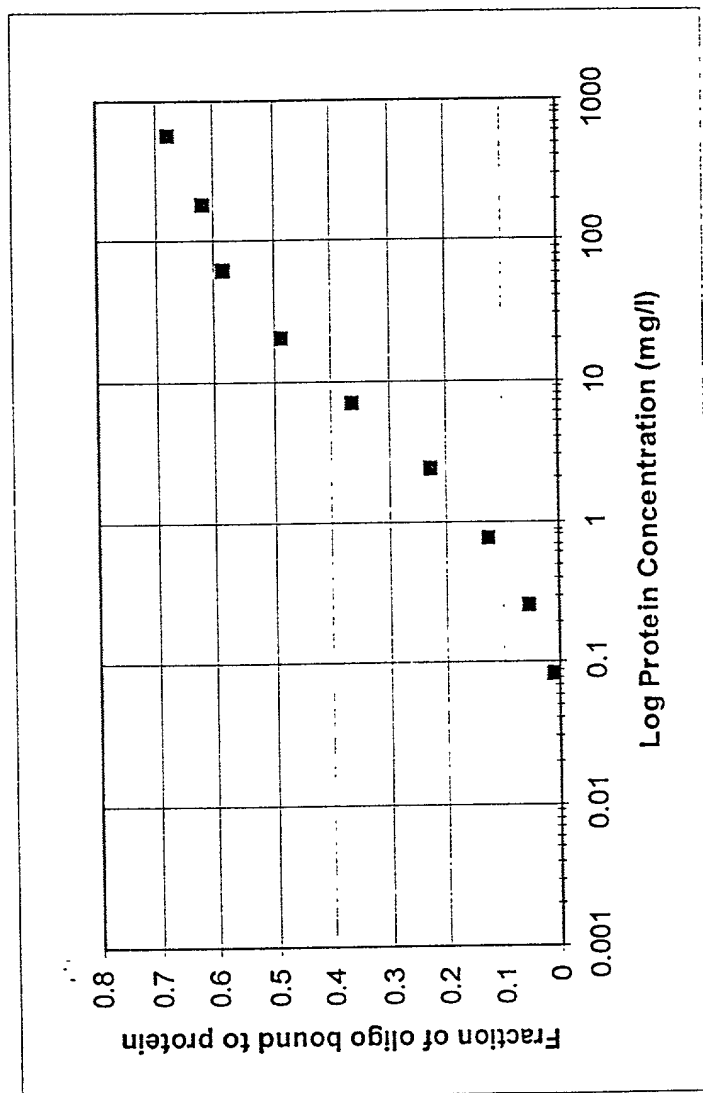


FIGURE 13

Log Protein Concentration (mg/l)	Fraction of oligo bound to protein
0.001	0.05
0.002	0.08
0.01	0.18
0.02	0.25
0.1	0.42
0.2	0.65
0.5	0.78
1	0.82
2	0.85
5	0.85
10	0.85
20	0.85
50	0.85
100	0.85
200	0.85
500	0.85
1000	0.85

1

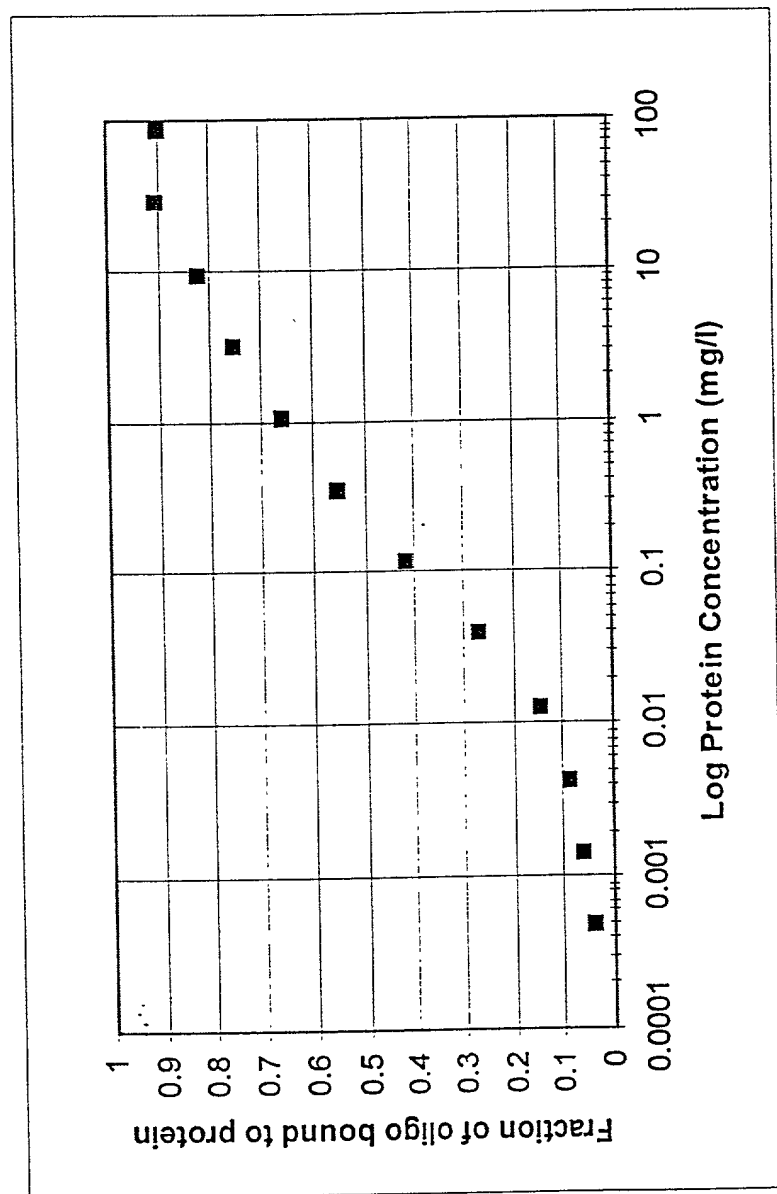


FIGURE 15

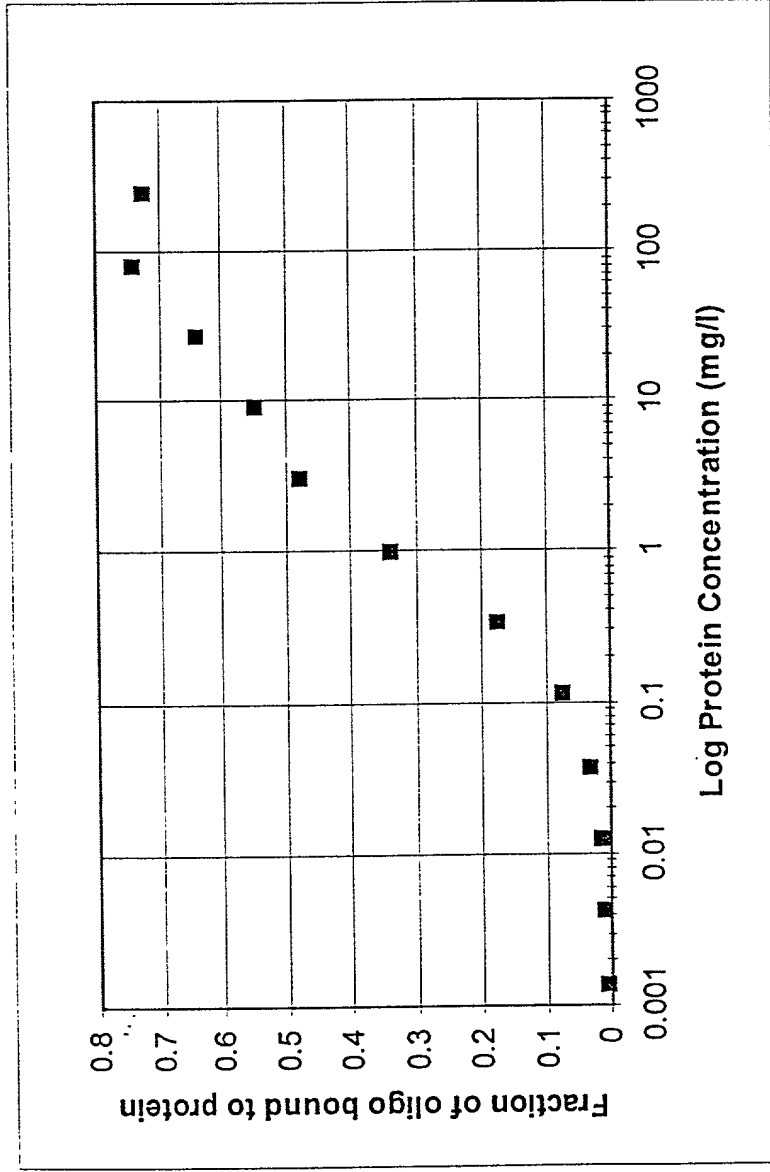


FIGURE 16

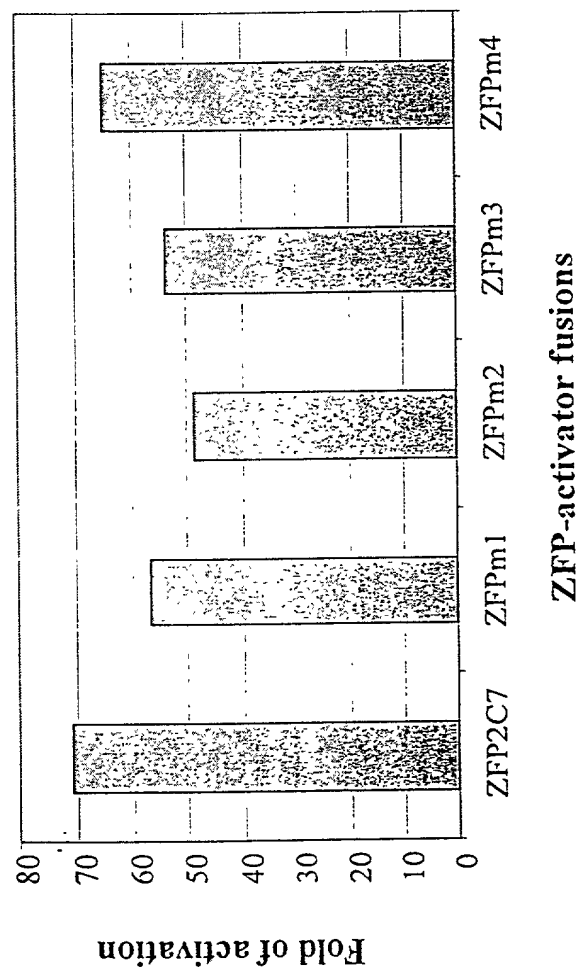
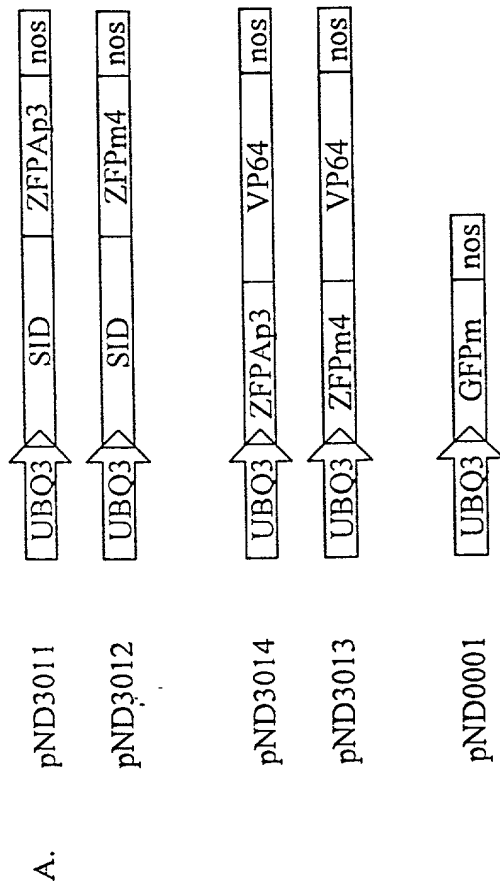


FIGURE 17



B.

pND0051	pND3011 in plant transformation vector with Hygmicine as selection marker
pND0052	pND3014 in plant transformation vector with Hygmicine as selection marker

FIGURE 18

FIGURE 19

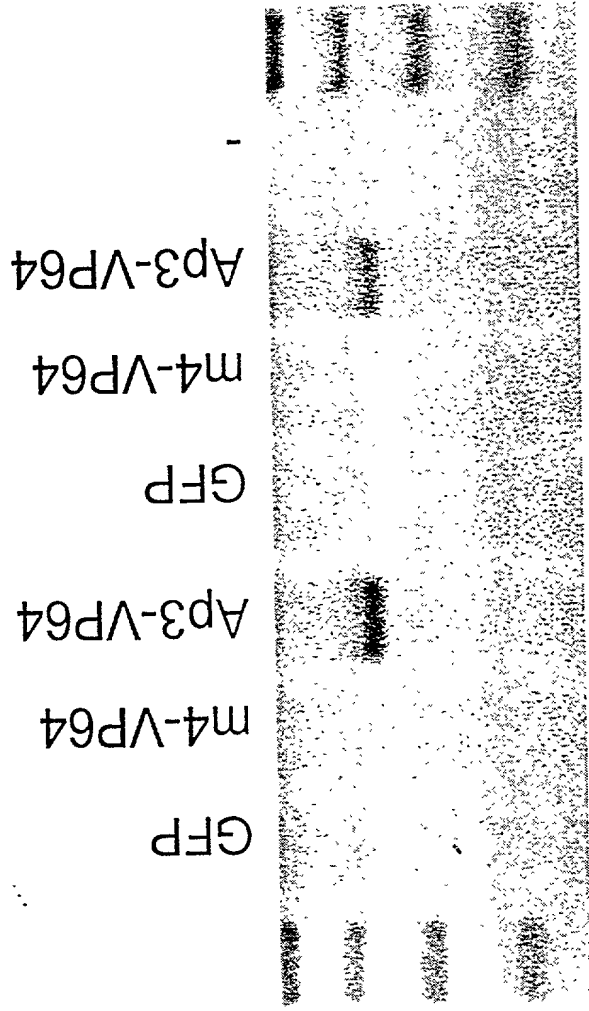




FIGURE 20

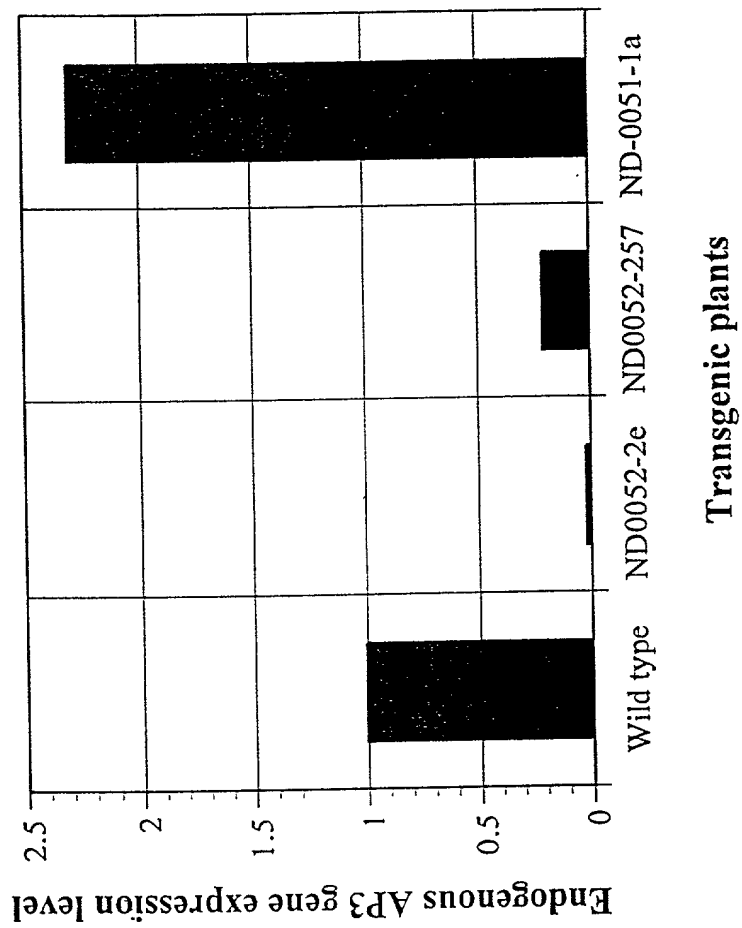


FIGURE 21

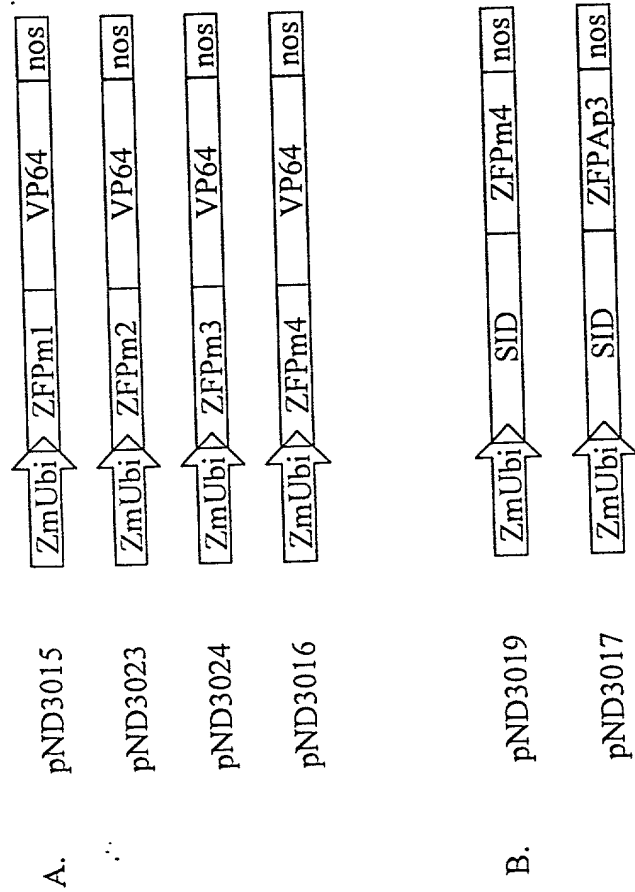


FIGURE 22

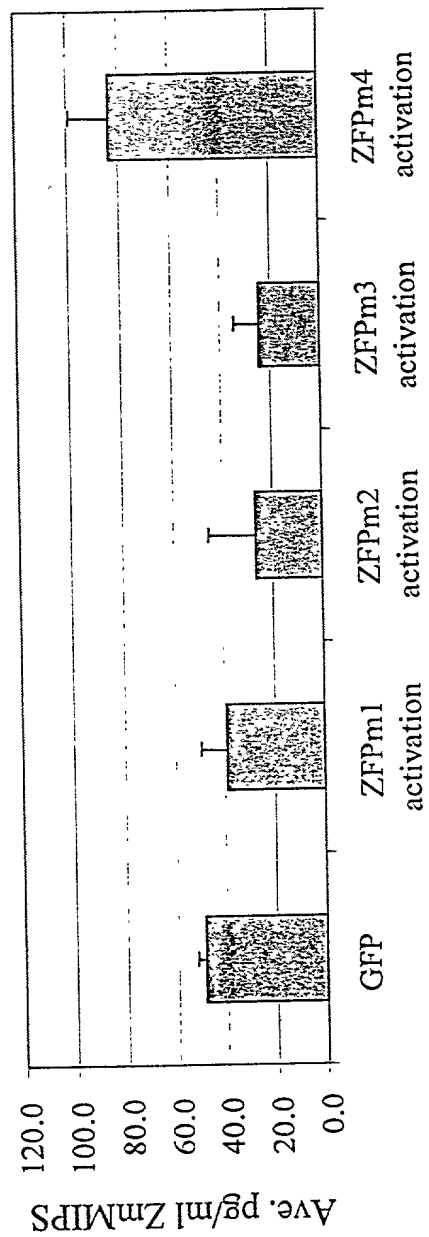


FIGURE 23

Figure 24

(1) Sequence of promoter CsVMV (Example 1A) (SEQ ID NO:1):

Tctagaaactagcttcagaaggttaattatccaagatgtagcatcaagaatccaatgtttacgggaaaaactatggaa
gtattatgtgagctcagcaagaagcagatcaatatgcggcacatatgcaacctatgttcaaaaatgaagaatgtacagatacaag
atcctatactgccagaatacgaagaagaatacgtagaaattgaaaaagaagaaccaggcgaagaaaagaatcttgaagacgta
agcactgacgacaacaatgaaaagaagaagataaggctgggtgattgtgaaagagacatagaggacacatgtaagggtggaaaa
tgtaagggcggaagtaaccttatcacaaggaatcttatccccactacttatccttttatattttccgtgtcattttgcccttgagtt
ttcctataaaggaaccaagttcggcatttgtgaaaacaagaaaaaatttggtgtaagctattttcttgaagtactgaggatacaact
tcagagaaatttgaagtttga

Total 531 bp

(2) Sequence of zinc finger protein 2C7 binding site (Example 1A) (SEQ ID NO:2):

GCG TGG GCG GCG TGG GCG

Total 18 bp.

(3) Sequence of promoter pc7rbTATA (Example 1A) (SEQ ID NO:3):

Cccgggtatataataagcttggcattccggtactgttggttaaagccacat

Total 51 bp.

(4) Sequence of pND3008 coding region (Example1B) (SEQ ID NO:4):

agcgtgacccggctgtgccctctctagagataatgagcattgcatgtctaagtataaaaaattaccacatattttttg
tcacactgtttgaagtgcagttatctatctttatacatattttaactttactctacgaataatataatctatagtactacaataatca
gtgttttagagaatcatataaatgaacagttagacatggctctaaaggacaattgagtatttgacaacaggactctacagttttatcttt
ttagtgtcatgtgttctcctttttttgcaaatagcttcacctatataaacttcacattttattagtacatccatttagggtttagggtt
aatggttttatagactaatttttttagtacatctattttattctattttagcctctaaattaagaaaactaaaactctatttttagtttttatta
ataatttagatataaaaatagaataaaaataaagtactaaaaataaacaataaccctttaagaaattaaaaaactaaggaaacatttt
tctgtttcgagtagataatgccagcctgttaaacgccgtcgacgagctaacggacaccaaccagcgaaccagcagcgtcgcg
tcgggccaagcgaagcagacggcacggcatctctgtcgtgcctctggacccctctcgagagttccgctccaccgttgacttg
ctccgctgtcggcatccagaaattgcgtggcggagcggcagacgtgagccggcacggcagcggcctctcctctctcacg
gcacggcagctacgggggattcctttccaccgctccttcgctttccctcctcgcggcgccgtaataaafagacacccctccaca

ccctcttccccaacctcgtgtgttcggagcgcacacacacaaccagatctccccaaatccaccgctcggcacctccgctt
caaggtacgccgctcgtcctccccccccccccctctaccttctctagatcggcgttccggtccatggttagggcccggtagttc
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cgatgattatcatctaatcttctgttgaattacgttaagcatgtaataaatacatgtaatgcacgttatttatgagatgggtttttatga
ttagagtcgccgaattatacatttaatacgcgatagaaaacaaaatagcgcgcaactaggataaattatcgcgcgcggtgtca
tctatgttactagatccgggaattgggtac

Total:	3120 bp
ZmUbi promoter:	44 bp to 2026 bp
Six finger ZFP2C7:	2060 bp to 2588 bp
Nuclear localization signal:	2620 bp to 2641 bp
VP64 activation domain:	2641 bp to 2805 bp

HA epitope tag: 2805 bp to 2836 bp

Nos terminator: 2884 bp to 3164 bp

(5) Sequence of pND3018 coding region (Example 1B) (SEQ ID NO:5):

agcgtgacccggcgtgccccctctagagataatgagcattgcatgtctaagttataaaaaattaccacatattttttg
tcacattgtttgaagtgcagttatctatctttatacatatattaaactttactctacgaataatataatctatagactacaataatca
gtgttttagagaatcatataaatgaacaggttagacatggctctaaaggacaattgagtatttgacaacaggactctacagttttatctt
ttagtgtgcatgtgttccttttttgc aaatagcttcacatataataacttcatccattttattagtagacatccatttagggttaggggt
aatggttttatagactaatttttttagtacatctattttattctatttttagcctctaaattaagaaaactaaaactctatttttagtttttatta
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tcgggccaagcgaagcagacggcgcacggcatctctgtcgtgcctctggacccctctcgagagttccgctccaccgttgacttg
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cggagtagaataactgtttcaaacctacctgggtgtatttattaattttggaactgtatgtgtgtgcatacatctcatagttacgagtttaag
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ggataaattatcgcgcgcggtgtcatctatgttactagatccgggaattccggaccggtaccagcgcc

Total:	3068 bp
ZmUbi promoter:	44 bp to 2026 bp
SID repression domain:	2066 bp to 2173 bp
Nuclear localization signal:	2174 bp to 2194 bp
Six finger ZFP2C7:	2207 bp to 2735 bp
HA epitope tag:	2762 bp to 2791 bp
Nos terminator:	2820 bp to 3112 bp

(6) Sequence of 6X2C7 binding site (SEQ ID NO:6):

Cgtgctagcgcgtgggcggcgtgggcgaacaagcgtgggcggcgtgggcgaacaagcgtgggcggcgtgggc
gactagtgtagcgcgtgggcggcgtgggcgaacaagcgtgggcggcgtgggcgaacaagcgtgggcggcgtgggcgac
tagtg

Total: 155 bp

(7) Sequence of 3 finger protein C7:

Atggcccaggcggccctcgagccctatgcttgcctgtcagtcctgcgatcgccgcttttctaagtcggctgatctg
aagcgccatatccgcatccacacaggccagaagccctccagtgtcgaatatgcatgcgtaacttcagtcgtagtaccacctta
ccacccacatccgcacccacacaggcgagaagcctttgcctgtgacatttgtgggaggaagtttgcaggagtgatgaacgca
agaggcatacaaaatccatttaagacagaaggactctagaactagtggccaggccggccaggctagc

Total: 314 bp

(8) Amino acid sequence of 3 finger protein C7:

Maqaalepyacpvescdrrfsksadlkrhrihtgqkpfqcricmrnfsrcdhlthirhtgekpfacdicgrkfar
sderkrhtkihlrqkdsrtsgqagqas

Total: 105 aa

(9) Sequence of zinc finger protein ZFPap3 binding site:

GAT GGA GTT GAA GAA GTA

Total: 18 bp

(10) Sequence of zinc finger protein ZFPm1 and ZFPm2 binding site m12:

GCC TCC TTC CTC CTC TCA CTC

Total: 21 bp

ZFPm1 binding site: compliment strand of 1 to 18

ZFPm2 binding site: compliment strand of 4 to 21

(11) Sequence of zinc finger protein ZFPm3 and ZFPm4 binding site m34:

GCC AAC TAC TAC GGC TCC CTC ACC

Total: 21 bp

ZFPm3 binding site: compliment strand of 1 to 18

ZFPm4 binding site: compliment strand of 7 to 24

(12) Partial sequence of pMal-m1 (1-3300 bp) and zinc finger protein ZFPm1
(2719-3270 bp) (SEQ ID NO:14):

ccgacaccatcgaatggtgcaaaaccttcgcggtatggcatgatagcgcccggaagagagtcaattcagggtggt
gaatgtgaaaccagtaacgttatacgaatgctgcagagatgcccgtgtctcttatcagaccgtttcccgctggtgaaccaggcca
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cggcttgacaatctcgtccggcaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtgtaagtccttcagcc
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caggccggccacctggccagccatcaacgcactcactggcgagaagccatacaaatgtccagaatgtggcaagtctttctct
cggcttgacaatctcgtccggcaccaacgtactcacaccggtaaaaaactagtggccaggccggccagtagccgtacgacgt
tccggactacgt

Total: 514 bp

Primer F1-f1 of ZFPm1: 2770 bp to 2850 bp

Primer F1-f2 of ZFPm1: 2740 bp to 2790 bp

Primer F2-f of ZFPm1: 2867 bp to 2940 bp

Primer F2-b of ZFPm1: 2824 bp to 2889 bp

Primer F3-b1 ZFPm1: 2916 bp to 2973 bp

Primer F3-b2 ZFPm1: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm1: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm1: 2992 bp to 3042 bp

Primer F5-f of ZFPm1: 3119 bp to 3192 bp

Primer F5-b of ZFPm1: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm1: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm1: 3205 bp to 3273 bp

(13) Sequence of zinc finger protein ZFPm1

(Translated from pMal-m1: 2719-3270 bp):

Aqaalepgekyacpecgksfsdpghlvhrhqrthtgekpykcpecgksfsqrahlerhqrthtgekpykcpec
gksfsqssnlvrhqrthtgekpyacpecgksfsrsdnlvrhqrthtgekpykcpecgksfsrsdnlvrhqrthtgekpykcpe
cgksfsqaghlashqrthtgkktsgqag

(14) Partial sequence of pMal-m2 (1-3300 bp) and zinc finger protein ZFPm2

(2719-3270 bp) (SEQ ID NO:15):

ccgacaccatcgaatggtgcaaaacctttcgcggtatggcatgatacgccccggaagagagcaattcagggtggt
gaatgtgaaaccagtaacgttatacgaatgctgcagagatgcccgggtgtctcttatcagaccgtttcccgcgtggtgaaccaggcca
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca
actggcgggcaaacagtcgttgctgattggcgttgccacctccagctcggccctgcacgcgccgtcgcaaattgtcgcggcgat
taaatctcgcgccgatcaactgggtgccagcgtggtggtgctgatggtagaacgaagcggcgctgaagcctgtaaacggcg
gtgcacaatcttctcgcgcaacgcgtcagtggtgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg
cctgcactaatgttccggcggtatttcttgatgtctctgaccagacacctcaacagattatttttcccatgaagacgggtacgcga
ctgggcgtggagcatctggctgcattgggtcaccagcaaatcgcgctgttagcggggccattaagtctgtctcggcgctgtgc

gtctggctggctggcataaatatctcactcgcaatcaaatcagccgatagcggaaagggaaggcgactggagtgccatgtccg
gttttaacaaaccatgcaaatgctgaatgagggcatcgttcccactgcgatgctggttgccaacgatcagatggcgctgggcgc
aatgcgcgccattaccgagtcgggctgcgcgttggtgcggatatctcggtagtgggatacgacgataccgaagacagctcat
gttatatcccgccgftaaccaccatcaaacaggatttccctgctggggcaaacagcgtggaccgcttgcgaactctctcag
ggccagcggtgaagggaatcagctgttcccgtctcactggtgaaaagaaaaaccacctggcgcccaatagcgaaccg
cctctccccgcgcgttggccgattcattaatgcagctggcacgacaggttcccactggaaagcgggcagtgagcgcaacgc
aattaatgtgagttagctcactcattaggcacaattctcatgttgacagcttatcatcactgcacggtgcaccaatgcttctggcgt
caggcagccatcggaagctgtggtatggctgtgcaggtcgtaaatcactgcataatcgtgtcgtcaaggcgactcccgttct
ggataatgttttgcgccgacatcataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt
gtggaattgtgagcggataacaatttcacacaggaaacagccagtcctttaggtgttttcacgagcacttcaccaacaaggacc
atagattatgaaaactgaagaaggtaaactggtaacttggaataacggcgataaaggctataacggctcgtgaagtcggtaag
aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattcccacaggttgcggcaact
ggcgatggccctgacattatcttctgggcacacgaccgcttgggtggctacgctcaatctggcctgttggctgaaatcaccccg
acaaagcgttcaggacaagctgtatccgtttacctgggatgccgtactgtacaacggcaagctgattgcttaccgatcgtgtt
gaagcgttatcgtgattataacaagatctgctgccgaaccgccaaaaacctgggaagagatccggcgctggataaagaa
ctgaaagcgaaaggtaagagcgcgtgatgttcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt
tatgctgttaagtatgaaaacggcaagtacgacattaaagacgtggcgctggataacgctggcgcgaaagcgggtctgaccttc
ctggttgacctgattaaaaacaacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag
cgatgaccatcaacggcccgtggcatggtccaacatcgacaccagcaaagtgaattatggtgtaacggtactgccgacctca
agggtcaacctcaaacccgttcgttggcggtgctgagcgcaggtattaacgccgccagtcgaacaaagagctggcaaaaga
gttctctgaaaactatctgctgactgatgaaggctggaagcggtaataaagacaaaccgctgggtgccgtagcgtgaagtct
tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccagaaaggtgaaatcatgccgaacatcc
cgcagatgtccgcttctggtatgccgtgcgtactgcggtgatcaacgccgccagcggctcgtcagactgtcgtgaagccctga
aagacgcgcagactaatcgagctgaacaacaacaataacaataacaacaacctcgggatcgagggaaggatttcagaa
ttcgatcctcttctctgtggcccaggcggccctcgagccggggagaagccctatgcttgccggaatgtgtaagtccttctc
tcagagctctcacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttttag
ccagtcagcaacctggtgcgccatcaacgcactcactggcgagaagccatacaaatgtccagaatgtggcaagtctttctct
cggcttgacaatctcgtccggcaccacgtactcacaccggggagaagccctatgcttgccggaatgtgtaagtccttcagcc
gcagcgataacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttttagc
caggccggccacctggccagccatcaacgcactcactggcgagaagccatacaaatgtccagaatgtggcaagtctttctct

cggctcgacaatctcgtccggcaccaacgtactcacaccggtaaaaaaactagtgccaggccggccagtacccgtacgacgt
tccggactacgct

Total: 514 bp

Primer F1-f1 of ZFPm2: 2770 bp to 2850 bp

Primer F1-f2 of ZFP m2: 2740 bp to 2790 bp

Primer F2-f of ZFP m2: 2867 bp to 2940 bp

Primer F2-b of ZFPm2: 2824 bp to 2889 bp

Primer F3-b1 ZFPm2: 2916 bp to 2973 bp

Primer F3-b2 ZFPm2: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm2: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm2: 2992 bp to 3042 bp

Primer F5-f of ZFPm2: 3119 bp to 3192 bp

Primer F5-b of ZFPm2: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm2: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm2: 3205 bp to 3273 bp

(15) Partial sequence of pMal-m3 (1-3300 bp) and zinc finger protein ZFPm3

(2719-3270 bp) (SEQ ID NO:16):

ccgacaccatcgaatggtgcaaacctttcgcggtatggcatgatacgcccgaagagagtcaattcagggtggt
gaatgtgaaaccagtaacgttatac gatgtcgcagagtatccggtgtcttatacaccgtttccgcgtggtgaaccaggcca
gccacgtttctgcgaaaacgcgggaaaaagtggaaagcggcgatggcggagctgaattacattcccaaccgcgtggcacaaca
actggcgggcaaacagtcgttgctgattggcgttgccacctcagctctggccctgcacgcgccgtcgaaattgtcgcggcgat
taaattctcgccgatcaactgggtgccagcgtggtggtgctgatggtagaacgaagcggcgtcgaagcctgtaaagcggcg
gtgcacaatcttctcgcgcaacgcgtcagtggtgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg
cctgcactaatgttccggcgttatttcttgatgtctctgaccagacacccatcaacagtatttttctcccatgaagacggtacgcga
ctgggcgtggagcatctggtcgcattgggtcaccagcaaatcgcgctgttagcgggccattaagtctgtctcggcgcgtctgc
gtctggctggctggcataaatatctcactcgcaatcaaatcagccgatagcggaaacgggaaggcgactggagtccatgtccg
gtttcaacaaaccatgcaaatgctgaatgagggcatcgttccactgcgatgctggttgccaacgatcagatggcgtgggcgc
aatgcgcgccattaccgagtcgggctgcgcgttggtgcggatatctcggtagtgggatacgacgataccgaagacagctcat
gttatatcccgccgttaaccacatcaaacaggatttgcctgctggggcaaaccagcgtggaccgcttgcgaactctctcag

ggccaggcgggtgaagggaatcagctgtgcccgtctactggtgaaaagaaaaaccacctggcgccaatacgcgaaccg
cctctccccgcgcgttgccgattcattaatgcagctggcacgacaggttcccactggaaagcgggcagtgcgcgaacgc
aattaatgtgagttagctcactcattaggcacaattctcatgtttgacagcttatcatcactgcacgggtgcaccaatgcttctggcgt
caggcagccatcggaagctgtggtatggctgtgcaggtcgtaaatcactgcataattcgtgtcgtcaaggcgactcccgttct
ggataatgtttttgcgccgacataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt
gtggaattgtgagcggataacaattcacacaggaaacagccagtcctgttaggtgtttcacgagcacttcaccaacaaggacc
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aaattcgagaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattcccacaggttgcggcaact
ggcgatggccctgacattatcttctgggcacacgaccgtttgggtgtacgtcaatctggcctgttggtgaaatcaccccg
acaaagcgttcaggacaagctgtatccgtttacctgggatgccgtacgttacaacggcaagctgattgcttaccgatcgtgtt
gaagcgttatcgtgattataacaagatctgctgccgaacccgccaaaaacctgggaagagatccggcgctggataaagaa
ctgaaagcgaaaggaagagcgcgtgtgttcaacctgcaagaacctgacttcacctggccgctgattgctgctgacgggggt
tatgcttcaagtatgaaaacggcaagtacgacattaagacgtggcgctggataacgctggcgcgaaagcgggtctgaccttc
ctggttgacctgattaaaaacaacacatgaatgcagacaccgattactccatcgcagaagctgcctttaataaaggcgaaacag
cgatgaccatcaacggcccggtggcatggccaacatgcacaccagcaaagtgaattatggtgtaacgggtactccgaccttca
agggtcaaccatccaaaccgttcgttggcgtgctgagcgcaggtattaacgccgcagtcgaacaaagagctggcaaaaga
gttcctcgaaaactatctgctgactgatgaaggcttgggaagcggtaataaagacaaaccgtgggtgccgtagcgtgaagctt
tacgaggaagagttggcgaaagatccacgtattgccgccaccatgaaaacgcccgaaaggtgaaatcatgccgaacatcc
cgcagatgtccgctttctggtatgccgtgcgtactgcggtgatcaacgccgccagcggctcgtcagactgtcgtgatgaagccctga
aagacgcgcagactaattcgagctcgaacaacaacaataacaataacaacacctcgggatcgagggaaggatttcagaa
ttcggatcctcttctctgtgcccaggcggccctcgagccggggagaagccctatgcttgcgggaatgtggttaagtccttca
gcgatcctggccacctggttcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttta
gcaccagcggctccctggtgcgccatcaacgcactcatactggcgagaagccatacaaatgtccagaatgtggcaagtcttca
gccagagctccagcctggtgcgccaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtggttaagtccttca
gccagagcagctccctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt
agtactgccgcgaccttgcctgccatcaacgcactcatactggcgagaagccatacaaatgtccagaatgtggcaagtcttct
cccaatccagccatctcgtccggcaccacgtactcacaccggtaaaaaactagtggccaggccggccagtaccgtacgac
gttccgactacgt

Total: 514 bp

Primer F1-f1 of ZFPm3: 2770 bp to 2850 bp

Primer F1-f2 of ZFP m3: 2740 bp to 2790 bp

Primer F2-f of ZFP m3: 2867 bp to 2940 bp

Primer F2-b of ZFPm3: 2824 bp to 2889 bp

Primer F3-b1 ZFPm3: 2916 bp to 2973 bp

Primer F3-b2 ZFPm3: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm3: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm3: 2992 bp to 3042 bp

Primer F5-f of ZFPm3: 3119 bp to 3192 bp

Primer F5-b of ZFPm3: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm3: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm3: 3205 bp to 3273 bp

(16) Partial sequence of pMal-m4 (1-3300 bp) and zinc finger protein ZFPm4
(2719-3270 bp) (SEQ ID NO:17):

ccgacaccatcgaatgggtgcaaaaccttcgcggtatggcatgatagcgcccgaagagagtcaattcagggtggt
gaatgtgaaaccagtaacgttatacagatgctgcagagtatgccggtgtctcttatcagaccgtttcccgctggtgaaccaggcca
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca
actggcgggcaaacagtcgttgctgattggcgttgccacctccagtctggccctgcacgcgccgtcgaaattgtcgcggcgat
taaatctcgcgccgatcaactgggtgccagcgtgggtggtgctgatggtagaacgaagcggcgctgaagcctgtaaagcggcg
gtgcacaatcttctcgcgcaacgcgtcagtggtgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg
cctgcactaatgttccggcgttatttcttgatgtctctgaccagacacctcaaacagtattatcttccatgaagacggtagcga
ctggcgctggagcatctggtcgcattgggtcaccagcaaatcgcgctgtagcgggcccattaagtctgtctcggcgctctgc
gtctggctggctggcataaatactcactcgcaatcaaatcagccgatagcggaaagggaaggcgactggagtgccatgtccg
gtttcaacaaaccatgcaaatgctgaatgagggcacgttccactgcgatgctggttccaacgatcagatggcgctgggcgc
aatgcgcgccattaccgagtcgggctgcgcgttggtgcggatatctcggtagtgggatacgacgataccgaagacagctcat
gttatatcccgccgttaaccaccatcaaacaggatttgcctgctggggcaaacaccagcgtggaccgcttgcactctctcag
ggccaggcgggtgaagggaatcagctgttgcctgtcactggtgaaaagaaaaaccacctggcgcccaatacgaaccg
cctctcccgcgcttggtggtgattcattatgcagctggcacgacaggttcccgactggaaagcgggcagtgagcgcaacgc
aattaatgtgagtagctcactcattaggcacaattctcatgttgacagcttatcatcactgcacggtgcaccaatgcttctggcgt
caggcagccatcggaagctgtggtatggctgtgcaggtcgtaaatcactgcataatcgtgtcgtcaaggcgactcccgttct
ggataatgtttttgcgccgacatcataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt

gtggaattgtgagcggataacaatttcacacaggaacagccagtcggttaggtgtttcacgagcacttcaccaacaaggacc
atagattatgaaaactgaagaaggtaaactggtaacttgattaacggcgataaaggctataacggctcgcgtgaagtcggtaag
aaattcgagaaagataccggaattaaagtcaccggtgagcatccggataaactggaagagaaattcccacaggttgccgcaact
ggcgatggccctgacattatcttctgggcacacgaccgcttgggtggctacgctcaatctggcctgttggtgaaatcacccggg
acaaagcgttcaggacaagctgtatccgtttacctgggatgccgtacgttacaacggcaagctgattgcttaccgatcgtgtt
gaagcgttatcgcgtgatttataacaaagatctgctgccgaacccgcaaaaacctgggaagagatccggcgctggataaagaa
ctgaaagcgaaaggtaagagcgcgctgatgttcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt
tatgcttcaagtatgaaaacggcaagtacgacattaaagacgtgggcgtggataacgctggcgcgaaagcgggtctgacctc
ctggttgacctgattaaaaacacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag
cgatgaccatcaacggcccggtggcatggtccaacatcgacaccagcaaagtgaattatggtgtaacggctactgccgacctca
aggggtcaaccatccaaaccgttggcgtgctgagcgcaggtattaacgccgccagtcggaacaaagagctggcaaaaga
gttctctgaaaactatctgctgactgatgaaggcttgaagcgggttaataaagacaaaccgctgggtgccgtagcgtgaagctt
tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccagaaaggtgaaatcatgccgaacatcc
cgcagatgtccgcttctggtatgccgtgcgtactcggtgatcaacgccgccagcggtcgtcagactgtcgtgaagccctga
aagacgcgcagactaattcgagctcgaacaacaacaataacaataacaacacccgggatcgagggaaggatttcagaa
ttcggatcctcttctctgtggcccaggcggccctcgagccggggagaagccctatgcttgcgggaatgtggttaagtccttca
gccagagcagctccctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgccggcaaatctttt
agccagagcagcagcctggtgcgccatcaacgcactcactactggcgagaagccatacaaatgtccagaatgtggcaagtcttc
agtattgtcgtgatcttgcgagggaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtggttaagtccttctc
tcagagctctcacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgccggcaaatcttttag
ccgcagcgataacctggtgcgccatcaacgcactcactactggcgagaagccatacaaatgtccagaatgtggcaagtcttctca
acttcaggccatttggctccgtcaccaacgtactcacaccggtaaaaaaactagtggccaggccggccagttaccgtacgacgtt
ccggactacgct

Total: 514 bp

Primer F1-f1 of ZFPm4: 2770 bp to 2850 bp

Primer F1-f2 of ZFPm4: 2740 bp to 2790 bp

Primer F2-f of ZFPm4: 2867 bp to 2940 bp

Primer F2-b of ZFPm4: 2824 bp to 2889 bp

Primer F3-b1 ZFPm4: 2916 bp to 2973 bp

Primer F3-b2 ZFPm4: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm4: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm4: 2992 bp to 3042 bp

Primer F5-f of ZFPm4: 3119 bp to 3192 bp

Primer F5-b of ZFPm4: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm4: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm4: 3205 bp to 3273 bp

(17) Partial sequence of pMal-Ap3 (1-3300 bp) and zinc finger protein ZFPap3
(2719-3270 bp) (SEQ ID NO:18):

ccgacaccatcgaatggtgcaaaaccttccgcggtatggcatgatagcgcccggaagagagtcaattcagggtggt
gaatgtgaaaccagtaacgttatacgaatgctgcagagtagtccggtgtctcttatcagaccgttcccgctggtgaaccaggcca
gccacgtttctgcgaaaacgcgggaaaaagtgggaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca
actggcgggcaaacagtcgttgctgattggcgttgccacctccagctctggccctgcacgcgccgtcgaaattgtcgcggcgat
taaatctcgcgccgatcaactgggtgccagcgtggtggtgctgatggtagaacgaagcggcgctgaagcctgtaaaggcg
gtgcacaatcttctcgcgaacgcgtcagtggtgctgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg
cctgcactaatgttccggcgttattcttgatgtctctgaccagacacctcaacagtagtatttttctccatgaagacggtacgcga
ctgggcgtggagcatctggtcgcattgggtcaccagcaaatcgcgctgttagcgggcccattaagtctgtctggcgcgtctgc
gtctggctggctggcataaatatctcactcgaatcaaatcagccgatagcgggaacgggaaggcgactggagtgccatgtccg
gtttcaacaaaccatgcaaatgctgaatgagggcatcgttccactgcgatgctggttgccaacgatcagatggcgtgggcgc
aatgcgcgccattaccgagtcgggctgcgcgttggtgcggatatctcggtagtgggatacgacgataccgaagacagctcat
gttatatcccgccgttaaccaccatcaaacaggatttccgctgctggggcaaacagcgtggaccgcttgcgaactctctcag
ggccaggcgggtgaagggaatcagctgttggcgtctcactggtgaaaagaaaaaccacctggcgcccaatacgaaacgg
cctctccccgcgcttgccgattcattaatgcagctggcacgacaggttcccgactggaaagcgggcagtgagcgcaacgc
aattaatgtgagttagctcactcattaggcacaattctcatgttgacagcttatcatcgaactgcacggtgcaccaatgcttctggcgt
caggcagccatcggaagctgtggtatggctgtgcaggtcgtaaatcactgcataatcgtgtcgtcgaaggcgactcccgttct
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gtggaattgtgagcggataacaattcacacaggaaacagccagtcggttaggtgtttcacgagcattaccaacaaggacc
atagattatgaaaactgaagaaggtaaactggaatctggaataacggcgataaaggctataacggctcgtcgtgaagtcggtgaag
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ggcgatggccctgacattatctctgggcacacgaccgttgggtggctacgtcaatctggcctgttggtgaaatcaccgccg
acaaagcgttccaggacaagctgtatccgttacctgggatgccgtacgttacaacggcaagctgattgcttaccgatcgtgtt

gaagcgttatcgctgattataacaaagatctgctgccgaacccgcaaaaacctgggaagagatcccggcgtggataaagaa
ctgaaagcgaaaggtaagagcgcgctgatgttcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt
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ctggttgacctgattaaaaacacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag
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tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccagaaaggtgaaatcatgccgaacatcc
cgcagatgtccgctttctggtatgccgtgcgtactgcggtgatcaacgccgccagcggcgtcagactgtcgtgaagccctga
aagacgcgcagactaattcgagctgaacaacaacaataacaataacaacaacctcgggatcgagggaaggatttcagaa
ttcggatcctcttctctgtggcccaggcggccctcgagccggggagaaagccctatgctgtccggaatgtggttaagtcctca
gccagagcagctccctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt
agccagtcagcaacctggtgcgccatcaacgcactcactatggcgagaagccatacaaatgtccagaatgtggcaagtctttc
agccagtcagcaacctggtgcgccaccaacgtactcacaccggggagaagccctatgctgtccggaatgtggttaagtccttc
agcaccagtggctccttggttagaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt
agccagcgcgccacctggaacgccatcaacgcactcactatggcgagaagccatacaaatgtccagaatgtggcaagtctttt
ctcaacttcaggcaacttggtccgtcaccaacgtactcacaccggtaaaaaactagtggccaggccggccagtaccgtagca
cgttccggactacgct

Total: 514 bp

Primer F1-f1 of ZFP Ap3: 2770 bp to 2850 bp

Primer F1-f2 of ZFP Ap3: 2740 bp to 2790 bp

Primer F2-f of ZFP Ap3: 2867 bp to 2940 bp

Primer F2-b of ZFP Ap3: 2824 bp to 2889 bp

Primer F3-b1 ZFP Ap3: 2916 bp to 2973 bp

Primer F3-b2 ZFP Ap3: 2953 bp to 3021 bp

Primer F4-f1 of ZFP Ap3: 3022 bp to 3102 bp

Primer F4-f2 of ZFP Ap3: 2992 bp to 3042 bp

Primer F5-f of ZFP Ap3: 3119 bp to 3192 bp

Primer F5-b of ZFP Ap3: 3076 bp to 3141 bp

Primer F6-b1 of ZFP Ap3: 3168 bp to 3225 bp

Primer F6-b2 of ZFPap3: 3205 bp to 3273 bp

(18) Sequence of oligo m12 (SEQ ID NO:19):

Biotin-GGa gcc tcc ttc ctc ctc tca ctc GGG TTTT CCC gag tga gag gag gaa gga
ggc tCC

Total: 58 bp

Lower case sequence: ZFPm1 and ZFPm2 binding site m12

(19) Sequence of oligo m34 (SEQ ID NO:20):

Biotin-GGa gcc aac tac tac ggc tcc ctc acc GGG TTTT CCC ggt gag gga gcc gta
gta gtt ggc tCC

Total: 58 bp

Lower case sequence: ZFPm3 and ZFPm4 binding site m34

(20) Sequence of oligo Ap3 (SEQ ID NO:21):

Biotin-GGt tac ttc ttc aac tcc atc GGG TTTT CCC gat gga gtt gaa gaa gta aCC

Total: 52 bp

Lower case sequence: ZFPap3 binding site

(21) Sequence of oligo NRI-1 (SEQ ID NO:22):

Biotin-GG ttc tac ccc tcc cac cgc GGG TTTT CCC gcg gtg gga ggg gta gaa CC

Total: 51 bp

(22) Sequence of oligo NRI-2 (SEQ ID NO:23):

Biotin-GG tgc ggc gac tgc agc agc GGG TTTT CCC gct gct gca gtc gcc gca CC

Total: 51 bp

(23) Sequence of oligo hHD-I (SEQ ID NO:24):

Biotin-GG ggc ccc gcc tcc gcc gcc GGG TTTT CCC gcc gcc gga gcc ggg gcc
CC

Total: 51 bp

(24) Sequence of oligo hHD-II (SEQ ID NO:25):

Biotin-GG ggc agc ccc cac ggc gcc GGG TTTT CCC ggc gcc gtg ggg gct gcc CC

Total: 51 bp

(25) Sequence of oligo c5p1-g (SEQ ID NO:26):

Biotin-GG gac acc ccc aac ccc gcc GGG TTTT CCC ggc ggg gtt ggg ggt gtc CC

Total: 51 bp

(26) Sequence of oligo c5p3-g (SEQ ID NO:27):

Biotin-GG ctc tgc tca tcc cac tac GGG TTTT CCC gta gtg gga tga gca gag CC

Total: 51 bp

(27) Sequence of oligo B3c2 (SEQ ID NO:28):

Biotin-GG acc cac cgc gtc ccc tcc GGG TTTT CCC gga ggg gac gcg gtg ggt CC

Total: 51 bp

(28) Sequence of oligo e2c-g (SEQ ID NO:29):

Biotin-GG cac tgc ggc tcc ggc ccc GGG TTTT CCC ggg gcc gga gcc gca gtg CC

Total: 51 bp

(29) Sequence of primer Ap3-F (SEQ ID NO:30):

GGCGAGAGGGAAGATCCAG

Total: 19 bp

(30) Sequence of primer NZlib5' (SEQ ID NO:31):

GGCCCAGGCGGCCCTCGAGC

Total: 20 bp

(31) Sequence of primer Ap3f4-R (SEQ ID NO:32):

CTCCTCTAATACGACTCACTATAGGGACACTCACCTAGCCTCTG

Total: 44 bp

(32) Sequence of primer m4f3-R (SEQ ID NO:33):

CCTCGCAAGATCACGACAATC

Total: 21 bp

(33) Sequence of quantitative PCR probe for AP3 (SEQ ID NO:34):

CCATTTCATCCTCAAGACGACGCAGCT

Total: 27 bp

(34) Sequence of quantitative PCR primer for AP3 (Forward) (SEQ ID NO:35):

TTTGGACGAGCTTGACATTCAG

Total: 22 bp

(35) Sequence of quantitative PCR primer for AP3 (Reverse) (SEQ ID NO:36):

CGCGAACGAGTTTGAAAGTG

Total: 20 bp

(36) Sequence of 2C7-SID (Figure 3) (SEQ ID NO:66):

gacggatcgggagatctcccgatcccctatggcgcactctcagtacaatctgctctgatgcccatagttaagccagta
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